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TREASURY DEPARTMENT
UNITED STATES PUBLIC HEALTH SERVICE

PUBLIC HEALTH BULLETIN No. 122
JUNE, 1922

PUBLIC HEALTH ADMINISTRATION IN ARIZONA

By

Passed Assistant Surgeon R. C. WILLIAMS
United States Public Health Service

Prepared by Direction of
THE SURGEON GENERAL

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PUBLIC HEALTH ADMINISTRATION IN ARIZONA.

By R. C. Williams,

Passed Assistant Surgeon, United States Public Health Service.

The following is the result of a study of the public health organization and activities in the State of Arizona. This study of public health work in Arizona was made at the invitation of the governor. It was begun on December 20, 1920, and completed March 28, 1921. The following towns were visited during the course of the study: Phoenix. Tucson, Douglas. Bisbee, Prescott, and Flagstaff.

Arizona has an area of 113,956 square miles; is divided into 14 counties and, according to the returns of the census of 1920, has a population of 334,162. The distribution of the population, according to color or race in 1920, was as follows: White, 291,449; Negro, 8,005; Indian, 32,989; Chinese, 1,137; Japanese, 550; all other (Filipino, Hindu, and Korean), 32. Of the total population 35.2 per cent is urban.

During the past 10 years the white population has increased by 70 per cent, while the Negro population increased by 298.5 per cent. The latter increase, however, was due chiefly to the presence of Negro troops in Arizona. The Mexican population comprises about 8 per cent of the total. The foreign-born white population numbered 78,099, constituting 23.4 per cent of the total population in 1920. These figures are from the report of the United States Bureau of the Census.

The largest county in the State has an area of 18,238 square miles; the smallest, an area of 1,229 square miles. The entire southern boundary of the State, 335 miles in length, forms a part of the international border between the United States and Mexico.

Several ranges of mountains traverse the State. Diagonally across the State from northwest to southeast are the Mogollon Mountains; in the southern part a range is found near the international border between Arizona and the Republic of Mexico. Numerous smaller ranges are found in various parts of the State. There are several points of considerable elevation. The highest town is 8,500 feet above sea level, the lowest 125 feet.

Few rivers are found; most of the land is desert. Within recent years, however, some of the desert land has been reclaimed for farming and grazing by irrigation.

The climate is dry and especially beneficial in the treatment of pulmonary conditions, particularly pulmonary tuberculosis. The winters in the central and southern sections at moderate elevation are salubrious. For this reason many visitors spend the winter months in Arizona. The many scenic wonders are an added inducement to visitors, as well as the pleasant winter climate.

The summer season in certain sections is warm; Yuma and Mohawk bear the distinction of being among the places having the highest recorded temperature in summer within the continental limits of the United States. The northern section of the State and other places with sufficient elevation are pleasant in summer.

The principal industries are mining, dairying, cattle and sheep raising, smelting and refining ores, farming in irrigated areas, and a small amount of dry farming. Cotton raising has become a very important industry within the past few years. There is some lumbering in the northern or wooded part of the State.

Acknowledgments are due, and are here made, to the governor, members and employees of the State board of health, local health authorities, and others for information and assistance received.

STATE BOARD OF HEALTH.

COMPOSITION OF THE BOARD.

The State Board of Health of Arizona consists of the governor, the attorney general, and the superintendent of public health. The governor is ex-officio president of the board, the attorney general ex-officio vice president, and the superintendent of public health is secretary.

MEETINGS.

The board is required to meet as often as once every six months at such place in the State as they may appoint.

SALARIES AND EXPENSES.

The president and vice president receive no compensation, but are paid 10 cents for every mile actually and necessarily traveled by them in the performance of their official duties, and other necessary expenses incurred by them.

POWERS AND DUTIES.

The powers and duties of the State board of health are:

1. To fix a time and place of the meetings of the board, subject to the provisions mentioned above.

2. To make rules and regulations for the government of the board, its officers, and meetings.

3. To make and enforce all needful rules and regulations for the prevention and cure and to prevent the spread of any contagious, infectious, or malarial diseases among persons and domestic animals.

4. To establish quarantine and isolate any person affected with any contagious or infectious or epidemic or endemic disease.

5. To isolate, kill, or remove any animal affected with contagious or infectious disease, when necessary to protect the public health.

6. To remove, or cause to be removed, any dead, decaying, or putrid body, or any decayed, putrid, or other substance that may endanger the health of persons or domestic animals.

7. To condemn, or cause to be destroyed, any impure or diseased article of food that may be offered for sale.

8. To superintend the several boards of health in the cities and towns and the county boards of health of the several counties.

9. To empower and direct the superintendent of public health to do, or cause to be done, any and all of the things mentioned above in subdivisions 4, 5, 6, 7, and 8.

10. To make such rules and regulations as it may deem necessary to govern the preparation of dead bodies for transportation, and to govern what classes of dead bodies may be transported, and the manner thereof.

11. To have charge of the registration of births and deaths and to enforce with uniformity and thoroughness the vital statistics law throughout the State.

12. To render to the governor biennially a report of work done.

SUPERINTENDENT OF PUBLIC HEALTH.

The superintendent of public health is required to be a practicing physician of the State, who is nominated by the governor, and by and with the consent and advice of the senate is appointed for a term of two years. The superintendent of public health is secretary of the State board of health, and is required to keep a record of the proceedings of the board and to perform such other duties as the board may direct or as are prescribed by law.

The records kept by the superintendent of public health are to be at all times open to the public. The superintendent of public health is also State registrar of vital statistics, and is charged with the proper execution and enforcement of this law; he is further charged with the enforcement of the law requiring proper bathrooms, water-closets, and change rooms at certain industrial establishments. The administration of the law designed to prevent the adulteration of food or drink is also placed in the hands of the superintendent of public health. The actual prosecution of violations of this law is vested in the county attorney of the county in which the offense occurs.

PERSONNEL.

The personnel of the State health organization (exclusive of the membership of the board), with their respective annual salaries, is at present as follows:

Superintendent of public health (part time)	$1,000
State registrar of vital statistics (part time) (Superintendent of public health required by law to be State registrar.)	1,000
Director of bureau of venereal disease control (part time) (Also full-time health officer of city of Douglas, for which additional compensation is received.)	1,800
Director of surveys and inspection (full time)	3,000
Director of child welfare (full time)	1,200
Secretary to superintendent of public health	2,100
Statistical clerk	1,800
Public-health nurse (local work in only one town)	1,680
Clerk	900
Total	14,480

Office hours of the State board of health are from 9 a. m. to 5 p. m., with one hour for lunch. On Sundays and holidays the office is closed. Under the present arrangement the office is frequently left without anyone at the lunch hour. This should be changed so as to always have one employee in the office at the usual lunch hour.

VOUCHERS AND FILES.

Expenditures are made at the direction of the superintendent of public health. Bills for expenditures and salaries are audited and approved in the office of the superintendent of public health and attached to properly prepared vouchers, then forwarded to the State auditor for payment.

The State auditor prepares a warrant for the correct amount and transmits it to the office of the State board of health. There a notation is made of the amount and number of the warrant. It is then sent to the proper claimant.

The fiscal year of the State is from July 1 to June 30; all of the business of the office is conducted on this basis with the exception of the payment of accounts for fees with local registrars. The settlement of accounts with local registrars should be changed to correspond with the other work of the office; that is, at the end of the State fiscal year. The accounting of expenditures of the State board of health should also be arranged so as to show at a moment's notice the amount expended by any bureau or division.

The letter-filing system used is by subjects and individual names.

DISCUSSION.

As organized under the present law, the State board of health changes its membership with each change in the State officials. The general State election is held every two years, at which time the governor and attorney general are elected. They constitute the fixed members of the board. The superintendent of public health is a part-time official, his term of office being arranged to expire shortly after each succeeding set of State officials enter office. The superintendent of public health is appointed by the governor, with the advice and consent of the senate. This allows each governor to appoint a superintendent of public health. Thus it may occur that for political reasons the superintendent of public health may fail of reappointment, and the State may lose an efficient health officer. The law should be amended to remove the State board of health from direct political influence or changes.

The administration of the public health laws of the State should be delegated to a State health commissioner, who should be a full-time man. He should be expected to formulate plans and regulations, also provide the necessary technical information to the advisory board.

Public health administration to be effective must be done by a single executive, who must in turn be responsible to an advisory board. He should have an advisory board for the performance of judicial duties devolving upon the State health department. To such an advisory board the State health commissioner should be subordinate and held to account for the proper performance of his official duties.

A board composed of three persons, including one physician, would be a suitable number, the State health commissioner to be a member ex officio. This board should be composed of representative public-spirited citizens, and as the services rendered by them would be beyond recompense, no remuneration should be provided, except the actual and necessary traveling expenses allowed other State officials. Members of the board should be appointed by the governor for a term of six years, so arranged that a vacancy would occur every two years.

The State health commissioner should be required to devote all of his time to the duties of the office and should not be allowed to practice medicine, or have any other outside interests that would consume time from official duties. In return for his services the State health commissioner should be paid a salary in keeping with the duties and responsibilities of the office. The executive head of any State health department is a place of sufficient importance and responsibility to demand all of that official's time for the duties of the office.

Public health officials everywhere are agreed that the private practice of medicine and the proper performance of the functions of a health officer can not be done by one individual at the same time. An official whose time and interest is divided between private practice and public health duties can not give his best attention to either. This is especially true when a health officer is paid an insufficient salary for the public health work, and must look to his private practice as a means of supporting himself and family. It is manifestly unfair to expect a man to neglect his private work when the salary paid him as a health officer is too small to warrant anything but the most casual attention to the public health duties. No man can serve two masters.

In the business and industrial world any position of executive responsibility is always filled by an individual who devotes his entire time to the work. It is poor business to do otherwise. The business of public health is of a certainty, vitally important to a city, county, or State. Therefore, it is an equally poor business policy to use part-time and untrained persons as health officers where whole-time and well-trained officers are so urgently needed.

It is false economy for any State to employ a part-time executive head for the State health department. Even if the total appropriation is small, it is much better to have one well-trained person devoting his entire time to public health work than several part-time officials who give only a little time and less thought.

The State health commissioner should be appointed by the State board of health, with the approval of the governor. He should hold office as long as he discharges the duties of his office efficiently and satisfactorily. He should be a physician who has had experience in public health administration, and his previous place of residence should have no bearing on his appointment. The members of the board necessarily should be residents of the State. By such a plan as the above the protection of the health of the State would not become a matter of politics and the work of the State health department could be carried forward successfully and without political interruption.

The entire personnel of the State health department should hold office as long as efficient work is performed and not be discharged because of political reasons.

For the purpose of efficient administration, the work of the State health department should be separated into divisions, and a full-time chief, responsible to the State health commissioner, should be placed in charge of each division.

More commodious quarters for the State board of health should be provided in the statehouse. The present quarters are entirely inadequate.

REGISTRATION OF BIRTHS AND DEATHS.

The first systematic attempt to register the births and deaths occurring in the State was begun in 1909, pursuant to an act of the legislature. Prior to this law a few birth and death records were kept in some of the counties by the county board of supervisors or the county recorders. Such records, however, are very scattered and somewhat inaccurate.

The law under which the State board of health is now collecting vital statistics was enacted in 1913 and was put into operation the same year. This law is similar to but differing in several particulars from the model law, recommended by the United States Bureau of the Census.

This act establishes in the State board of health a bureau of vital statistics and makes the superintendent of public health State registrar of vital statistics.

A registration district is defined as a city or incorporated town, or that part of a county that is outside the corporate limits of cities or towns. The part of a county outside of the incorporated cities and towns is required to be divided into the necessary number of rural registration districts.

The county superintendent of public health is the county registrar of vital statistics. A registrar is required to be appointed for each registration district. The county registrar is paid an annual salary of $300 in addition to his salary of $300 per annum as county superintendent of public health.

Provision is made for the appointment of local registrars, deputy registrars, and subregistrars. Local registrars are paid 25 cents for each birth or death certificate, or report showing no births or deaths, that is filed with the State registrar. These fees are paid by the local authorities upon certification by the State registrar.

Each local registrar submits his certificates or reports to the county registrar. The county registrar, after making a record of the certificates or reports, transmits them to the State registrar. This particular part of the system seems to occasion considerable trouble. Some local registrars are negligent, and unfortunately, the county registrar is often careless and fails to forward to the State registrar all of the certificates and reports received from the local registrars.

The present officials of the State board of health state that in the administration of this law the most difficulty seems to lie with the county registrars. The suggestion has been made that the law be amended so as to permit the local registrars to submit the original birth and death certificates directly to the State registrar. At first glance such a change might seem desirable, but upon considering the matter in the light of local conditions in Arizona it is believed that such a change would not give the improvement expected.

The reasons for having the local registrars submit their reports to the county registrars and not directly to the State registrar may be summed up as follows:

1. The county superintendent of public health should be conversant with the vital statistics of his county. This can best be accomplished by having the original reports pass through his hands.

2. The work of local registrars can best be superintended by some one in the county.

3. In States like Arizona, where many of the counties are large, some of them as large as an average Eastern State, the matter of obtaining local registrars is a serious problem in the sparsely settled areas. This matter of appointing local registrars for thinly populated districts can certainly best be handled by a person in the county. Several of the local registrars in Arizona have territories of 500 or 600 square miles. One local registrar has a territory of 11,000 square miles; however, more than 10,000 square miles of this area is uninhabited desert. The remaining 1,000 square miles is thinly settled.

In order to obviate the difficulty experienced in getting prompt and accurate returns from the county registrars, several plans may be adopted. Local registrars could be instructed to submit promptly to the State registrar a list of the birth and death certificates transmitted to the county registrar each month. The State registrar would then be able to check up the returns of the county registrar against the lists submitted by the local registrars. Or the law could be amended to authorize the State board of health to remove unsatisfactory county and local registrars, as the county board of health is now authorized by law to remove local registrars who are derelict in the performance of their duties.

The law very clearly defines what is to constitute a primary registration district, and provides for registration within incorporated towns, cities, and the parts of counties outside the incorporated limits of cities and towns. There is no authority for a local registrar of a city or town to register any births or deaths, save those occurring within the town or city for which he is local registrar. Such practice has become established, however, and the local registrars for all of the cities and towns report births and deaths occurring in the territory surrounding the cities or towns.

This practice is not only contrary to the provisions of the vital-statistics law, but it confuses births or deaths occurring within incorporated towns with those reported from the surrounding rural or suburban areas. The county registrar for each county should be required to appoint a local registrar for each city or town in the county.

In the territory adjacent to the towns or cities a sufficient number of local registrars should be appointed to properly perform this work.

As a specific example of the confusion arising from the present plan, the following is cited: During this study it was desired to compare the vital statistics reported in the more important towns with those from the State at large. Inquiry developed the fact that the local registrars of the several towns also recorded births and deaths for a large area surrounding the towns. In most cases no effort is made to keep the rural reports separated from those occurring in the city proper.

The local registrar for the city of Phoenix recorded 981 births and 1,151 deaths in 1919, but only 585 of the births and 658 of the deaths actually occurred in Phoenix. The remainder occurred in the rural area surrounding Phoenix. There should be separate local registrars to record the rural statistics occurring near the towns.

In the city of Tucson 622 births and 771 deaths were recorded in 1920, but the local registrar did not record the rural statistics separately from those for the city; hence, the only way to obtain the correct birth and death rates for Tucson is to go through the reports filed and separate the rural from the city. Only a few of the towns keep the rural statistics separated from the urban. This practice should be discontinued and local registrars should be appointed for the territory surrounding the towns.

REGISTRATION OF DEATHS.

For the 12 months ending December 31, 1919, 5,040 deaths were registered with the State registrar, exclusive of stillbirths, making the death rate for the State for the year 1919, 15.08 per thousand. For the period of 12 months ending December 31, 1920, there were recorded with the State registrar 5,325 deaths, stillbirths excluded. The death rate for the State for 1920, based on these statistics, is 15.90 per thousand.

Arizona is well known as having a desirable climate for persons affected with tuberculosis. The low humidity of the atmosphere, moderate elevation, and mild winters, particularly in the central and southern parts, attract many persons who are suffering from pulmonary tuberculosis. Because of the climate, many individuals who have contracted tuberculosis elsewhere come to Arizona seeking health. In reviewing the death rate of the State it would, therefore, seem fair to exclude those deaths from tuberculosis where the disease was contracted outside the State.

In order to obtain an estimate of the annual number of deaths from tuberculosis contracted elsewhere it was necessary to tabulate from the death certificates for a specified period the State in which the disease was contracted. The total number of reported deaths in Arizona from all forms of tuberculosis for the year 1919 was 1,104. Of this number 238, or 21.55 per cent, gave Arizona as the place where the disease was contracted; 412, or 37.33 per cent, are stated as having contracted the disease in places other than Arizona. For 454, or 41.12 per cent, the place where the disease was contracted is unstated.

During 1920 there were 1,253 recorded deaths from all forms of tuberculosis; 237, or 18.89 per cent, were stated as having contracted the disease in Arizona; 502, or 40.07 per cent, gave other States or countries as the place of origin; and 514, or 41.04 per cent, were unstated.

	1919	1920
Total number of deaths, all forms of tuberculosis	1,104	1,253
Number stating Arizona as the place contracted	238	237
Number giving other States or countries as place contracted	412	502
Place disease contracted not stated	454	514

In reports of deaths from all forms of tuberculosis, Arizona was given as the place of origin in 1919 of 21.55 per cent, in 1920 of 18.89 per cent. An average, as shown by these percentages, is 20.22 per cent. However, it must be kept in mind that a large number of the deaths reported failed to give the place where the disease was contracted. Therefore, 20.22 per cent is apparently slightly lower than the actual percentage of deaths from tuberculosis contracted in the State.

It is fully realized that statistical data from death certificates is sometimes misleading, and that faulty conclusions may be drawn from data as above derived. With all this in mind, and in consideration of the observations made during this survey, also of the opinions of persons in the State familiar with actual conditions, it is thought fair to assume that in about 23 per cent, or 1 out of every 4½ deaths from tuberculosis in Arizona, the disease was contracted within the State.

Reasoning on the basis that 77 per cent of the deaths occurring from tuberculosis are contracted elsewhere, we are justified in subtracting 850 from the total of 1,104 reported deaths from tuberculosis in 1919, and 963 from the 1,253 such deaths reported in 1920. This leaves the actual number of reported deaths from tuberculosis contracted in Arizona for 1919 as 254, and for 1920 as 290. Therefore, the corrected death rate for tuberculosis appears to be 0.76 per 1,000 for the State in 1919 and 0.87 per 1,000 in 1920. In comparison with the corrected tuberculosis death rate with the tuberculosis death rate in States near by it is found that for 1919 the Arizona rate is 0.76 per 1,000; Kansas, 0.50; Utah, 0.44; Montana, 0.89. The States of California and Colorado, both of which have a large tuberculous population from other States, had rates of 2.15 and 1.75, respectively. It is believed that this tends to support the estimate that approximately 23 per cent of those who died of tuberculosis in the State contracted the disease in Arizona.

The corrected death rate per 1,000 for all causes for the State in 1919 is 12.57, and for 1920 is 13.03.

	1919	1920
Crude annual death rate per 1,000 for tuberculosis for the State	3.27	3.74
Estimated annual death rate per 1,000 for cases of tuberculosis arising within the State	.76	.87
Crude annual death rate per 1,000 for all causes for the State	15.08	15.90
Corrected annual death rate per 1,000 from all causes for the State	12.57	13.03

With a view to making an approximate estimate as to whether the State is obtaining satisfactory death registration, an effort was made to obtain figures for six or seven towns of the State where it is believed that fairly complete death returns are recorded. Upon investigation it was found that only one or two towns of the State keep accurate records of the births and deaths occurring in the city or town proper. All of the other towns recorded the births and deaths from the adjacent rural or suburban areas with those occurring in the town. Therefore it is impossible to compare the registration of births and deaths in the towns of the State with the rate of the State at large.

Previous reference has been made to this reprehensible practice of recording the vital statistics of adjacent rural areas with the town or city. Emphasis is again placed upon the fact that births and deaths occurring in the rural territory around towns should be registered by local registrars for such rural areas and never by a city local registrar. This practice not only destroys the value of the vital statistics for such towns but it causes the confusion of records that should be entirely distinct. Local city registrars should be forbidden to record any births or deaths, except those occurring within their town or city. A sufficient number of rural local registrars should be appointed for the area surrounding the towns and cities.

The registration of deaths in the State, although improving, can by no means be said to be complete.

Death certificates are card-indexed alphabetically and bound alphabetically by counties for each year.

PREVENTABLE DISEASES.

A study of the causes of death, shown on the 5,040 certificates of death registered for the 12 months ending December 31, 1919, shows that of this number 3,042 deaths may be considered as preventable in the usual sense of the word. But of these 3,042 deaths, 1,104 were due to tuberculosis, and of these, according to our estimate already given, 850 contracted the disease outside the State, leaving approximately 250 as the number of the deaths which may be ascribed to the State. This is 52 per cent of all the deaths after making deductions for tuberculosis contracted outside the State. A similar percentage for 1920 is 47.

Disease.	1919				1920			
	Total deaths recorded for 1 year, all ages.	Indicated annual death rate per 100,000.	Total number cases reported.	Indicated fatality rate per 100 cases.	Total deaths recorded for 1 year, all ages.	Indicated annual death rate per 100,000.	Total number cases reported.	Indicated fatality rate per 100 cases.
Typhoid fever	44	13.16	44	100.00	33	9.87	87	37.93
Measles	5	1.49	68	7.35	23	6.88	295	7.79
Scarlet fever	2	.59	33	6.06	1	.29	186	.54
Whooping cough	8	2.36	29	27.56	25	7.84	89	28.08
Diphtheria	21	6.32	47	44.68	27	8.07	90	30.00
Influenza	189	50.54	3	....	129	36.20	1,736	74.30
[1] Pulmonary tuberculosis	1,030	308.23	88	....	1,169	349.30	155	....
[1] Other forms of tuberculosis	74	22.14	0	....	84	25.13	0	....
Syphilis	32	9.57	71	45.00	23	6.88	130	17.68
Pneumonia (not bronchial)	688	205.88	1	....	490	146.63	78	....
Meningitis (exclusive of tubercular)	45	13.16	2	....	47	14.65	3	....
Diarrhoeal diseases (under 2 years)	528	158.07	....	....	537	160.70	....	....
Malignant growths	107	32.03	....	....	130	38.93	....	....
Puerperal septicemia	28	8.67	....	....	19	5.68	....	....
Other puerperal accidents	13	3.89	....	....	25	7.84	....	....
Mines and quarries	47	14.65	....	....	42	12.56	....	....
Other accidents	181	54.16	....	....	194	58.05	....	....
Total	3,042	....	386	....	2,998	....	2,749	....

[1] Includes those cases contracted outside of the State.

INFANT MORTALITY.

During the two 12-month periods ending December 31, 1919 and 1920, there were 1,015 deaths in 1919 and 1,224 in 1920, of children less than 1 year of age, exclusive of stillbirths (243 stillbirths in 1919 and 275 in 1920). This is 15.38 per cent of the births for 1919 and 15.23 per cent of all births for 1920. Based on such statistics, the infant mortality would appear to be slightly more than one of every six born. One child of every six born in Arizona dies before reaching the age of 1 year.

REGISTRATION OF BIRTHS.

The records show that for the 12 months ending December 31, 1919, 6,591 births were registered, giving a birth rate of 19.71 per 1,000 per annum. For the 12 months ending December 31, 1920, 8,045 births were recorded, with an annual birth rate of 24.04 per 1,000. This shows an increase of 1,456 registered births, or 18 per cent more than in 1919. Such an increase shows greater efficiency in administration of the law and more interest on the part of the citizens of the State in vital statistics. Taking the State as a whole, it appears that the rate for 1920 is still somewhat below the rate to be expected.

It is no doubt true that a number of births that occur are not recorded; however, there has been a marked improvement in the registration of births during the past two years. Prior to this the number of deaths recorded exceeded the births. Efforts of the Bureau of child welfare have been directed toward interesting physicians, midwives, and mothers in a more accurate registration of births. For each birth certificate that is received by the State registrar, a card is sent out by the child welfare bureau of the State board of health, informing the mother that the birth of the child has been recorded. If the child was unnamed at the time the birth certificate was filled out, attention is invited to this fact and a blank is inclosed upon which a supplementary report of the name of the child may be made. Literature on the care of infants is also forwarded to the mothers. This plan has assisted in arousing interest throughout the State in birth registration. It would appear that the work of acknowledging the registration of birth certificates, also follow-up work in obtaining names of children reported unnamed, is logically the duty of the bureau of vital statistics, rather than the bureau of child welfare.

The birth certificates are indexed alphabetically by counties for a given year and bound. All vital-statistics records are kept in a fireproof vault in the State capitol.

DISCUSSION.

As in the case of registration of deaths previously mentioned, the State health authorities complain of poor cooperation on the part of several of the county registrars in forwarding birth certificates. Methods for overcoming this difficulty have been discussed in connection with the comments on the registration of deaths.

The binding of many of the volumes of the birth and death certificates is very carelessly done. Many of the certificates are disarranged and out of their correct order. This fact was emphasized on several occasions when attempting to locate certificates in response to requests for certified copies. It was found in a number of instances that although the card index showed the certificate had been filed, the certificate could not be found, or was found entirely out of the proper place. All of the certificates now on record with the State board of health should be very carefully rearranged, rebound, and reindexed.

The epidemiological activities of the State board of health are rather limited. The epidemiological work performed is done by the director of surveys and inspections and the director of the State laboratory. The director of surveys and inspections is not a medical man, but is experienced in handling tuberculosis problems. The most important work done by the director of surveys and inspections consists of surveys in various parts of the State with reference to the distribution and prevalence of tuberculosis. The State board of health, although paying all of the salary received by the director of surveys and inspections, permits this official to give a large part of his time to duties as State secretary for one of the nonofficial agencies interested in the control of tuberculosis.

The director of the State laboratory is not a physician, but is well trained in bacteriological and chemical methods and has had some experience in epidemiological work. Because of lack of funds and insufficient assistance in the laboratory, the director of the State laboratory can devote but little time to field work for the State board of health.

REPORT OF DISEASES.

REQUIREMENTS OF LAW.

Whenever it shall come to the knowledge of any physician or other person that a contagious, epidemic, or infectious disease exists within the jurisdiction of any local board he shall immediately report to such board in writing the name and place of residence, if known, of every person afflicted with such disease, and if he is the attending physician of such person he shall report not less than twice each week the condition of each person so afflicted and the state of such disease.

REQUIREMENTS OF REGULATIONS.

Every physician who shall know or suspect that any person requiring his or her services professionally is suffering from any of the diseases required by regulations to be reported shall forthwith make report to the local board of health. The report shall be personally signed by the physician and contain such items of information as are indicated by the blanks. Cases merely suspicious or suspected shall be so reported, and the local board shall be promptly notified as soon as a definite decision is made as to the nature of the disease.

The law provides that a penalty of not less than $10 or more than $50, or by imprisonment in the county jail not exceeding 30 days, or both, for persons who secrete contagious or infectious diseases, also for physicians who fail to report same, or health officers who neglect their duties relating to the control of such diseases.

Under regulations of the State board of health the following diseases are declared to be communicable and dangerous to the public health and are required to be promptly reported to the local board of health:

Bubonic plague.
Chancroid.
Chickenpox.
Cholera (Asiatic or epidemic).
Dengue.
Diphtheria (diphtheritic croup or diphtheritic sore throat).
Epidemic cerebrospinal meningitis.
German measles.
Gonorrhea.
Hydrophobia (rabies).
Infantile paralysis.
Influenza.
Leprosy.
Malarial fever.
Measles.
Relapsing fever.
Scarlet fever (scarlatina or scarlet rash).
Smallpox (variola, varioloid).
Syphilis.
Tuberculosis.
Typhoid fever.
Typhus fever.
Whooping cough.
Yellow fever.

The regulations also provide that every keeper of a private house, boarding house, lodging house, or hotel must report the above diseases to the local board of health if such cases have not been attended by a physician.

Cases of Asiatic cholera, bubonic plague, smallpox, and yellow fever, in addition to the card report, are required to be reported immediately to the local board of health by the most expeditious method (telephone, telegraph, or messenger). Except in cases of smallpox, the executive officer of the local board of health is required to promptly advise the State board of health by telephone or telegraph of the presence of these diseases. Like immediate notice, in addition to the card report, is also required to be made to the local board of health of primary cases in a community of any of the following diseases:

Chickenpox.
Diphtheria.
Measles.
Scarlet fever.
Whooping cough.

County superintendents of public health and local health officers are provided with forms upon which to make written reports to the State board of health, giving the necessary data relative to the reportable diseases.

Under the act creating the State board of health power is granted the board to promulgate and enforce all needful rules and regulations for the prevention and cure, and to prevent the spread of any contagious, infectious, or malarial disease among persons and domestic animals. Pursuant to the authority granted by this act, regulations for the control of communicable diseases were adopted on April 25, 1914; an amendment to include control of venereal diseases was added on January 11, 1918. These regulations, for the most part, are full and complete. The terms, absolute, modified, and technical quarantine are defined as follows:

ABSOLUTE QUARANTINE.

First. Absolute prohibition of entrance to or exit from a building or conveyance, except by officers or attendants authorized by the health authorities, and the placing of guards, if necessary, to enforce this prohibition.

Second. The posting of warning placards, stating the name of the disease, in a conspicuous place or places on the outside of the conveyance or building.

Third. The prohibition of the passing out of any object or material from the quarantined house or conveyance.

Fourth. Provision for conveying the necessities of life, under certain restrictions, to those in quarantine.

MODIFIED QUARANTINE.

First. Prohibition of entrance and exit, as in absolute quarantine, except against certain members of the family authorized by the health authorities to pass in and out under certain definite restrictions.

Second. The placing of placards as under absolute quarantine.

Third. Isolation of the patient and attendants.

The wage earner is allowed, under modified quarantine, to continue work, provided at no time he comes in contact with the patient, and that he has and uses facilities for thoroughly cleansing his hands immediately before leaving the premises. The privilege of continuing work is not extended to wage earners employed in the production, sale, or manufacture of candy or food products, including milk and ice cream, nor to teachers or others whose work brings them in intimate contact with children.

TECHNICAL QUARANTINE.

In cases of venereal diseases, this includes regularly reporting to a physician for treatment till discharged, and refraining from acts that would tend to infect others.

The following diseases are specified as requiring absolute quarantine:

Bubonic plague.
Cholera.
Smallpox.
Yellow fever.

Diseases requiring modified quarantine:

Diphtheria.
Epidemic cerebrospinal meningitis.
Infantile paralysis.
Influenza.
Measles.
Scarlet fever.

Technical quarantine is used in the control of the following diseases:

Chancroid.
Gonorrhea.
Syphilis.

Placards are required to be placed on houses where the following diseases are present; such placards must be dated:

Chicken pox.
German measles.
Leprosy.
Mumps.
Typhoid fever.
Whooping cough.

The size of the placards to be used and the wording of such placards are specifically prescribed in absolute quarantine and modified quarantine.

The quarantine regulations also set forth certain rules for the exclusion of children from school. Pupils actually affected with the below-mentioned diseases are excluded from school.

Quarantinable diseases previously mentioned:

Acute contagious conjunctivitis.
Erysipelas.
Favus.
Impetigo contagiosa.
Pediculosis capitis (head lice).
Pediculosis corporis (body lice).
Scabies (itch).
Tina circinata (ring worm).
Tonsilitis.
Trachoma.

The regulations of the State board of health further provide for the inspection of railroad cars, when necessary, and removal of persons suffering from quarantinable diseases to isolation or detention. The reports required of county superintendents of public health are also described.

Communicable diseases reported to the Arizona State Board of Health for 1919 and 1920.

Disease.	1919		1920	
	Cases reported.	Indicated annual incidence rate per 100,000.	Cases reported.	Indicated annual incidence rate per 100,000.
Chickenpox	40	11.97	116	35.01
Chancroid	3	.89	6	1.78
Diphtheria	47	14.65	90	26.93
Gonorrhea	279	83.49	330	98.70
Infantile paralysis	3	.89	3	.89
Influenza	3	.89	1,736	519.80
Leprosy			1	.29

Communicable diseases reported to the Arizona State Board of Health for 1919 and 1920—Continued.

Disease.	1919		1920	
	Cases reported.	Indicated annual incidence rate per 100,000.	Cases reported.	Indicated annual incidence rate per 100,000.
Malaria	2	0.59	2	0.59
Measles	68	23.46	295	88.28
Meningitis	2	.59	3	.89
Mumps	7	2.09	50	15.26
Malta fever	....	....	1	.29
Pneumonia	1	.29	78	23.34
Rabies	2	.59	....	....
Scarlet fever	33	9.87	186	55.66
Smallpox	69	20.64	176	52.96
Syphilis	71	21.24	130	38.90
Tuberculosis	88	26.33	155	46.38
Typhoid fever	44	13.16	87	26.03
Whooping cough	29	8.67	89	26.63

The prompt reporting of communicable diseases is absolutely necessary for their control and prevention. By keeping a close watch on the prevalence of these diseases and instituting vigorous measures when indications point toward any increase over the normal endemic index many incipient epidemics may be checked. Any community, county, or State may expect to have some cases of communicable diseases. Sporadic cases may occur in any community. The matter of importance is to impress upon physicians and the general public the urgent need of promptly reporting to the health authorities all cases of communicable diseases or the presence of any outbreak of disease not fully understood.

The above table indicates that the reporting of communicable diseases in Arizona is given but little consideration. The figures for 1920 show an improvement over those for the year previous. The statistics for gonorrhea, syphilis, and influenza show the value of special campaigns for encouraging the reporting of certain diseases.

METHODS OF PROCEDURE.

The office of the State board of health performs most of its functions by means of correspondence. Occasionally the superintendent of public health or some employee of the board goes on a trip for the purpose of making an investigation, delivering an address or assisting some local health officer. Inadequate appropriations and lack of the necessary full-time field force prevents the proper attention to even the more important public-health problems of the State.

Nature has endowed Arizona with a healthful climate and splendid natural resources, but even such advantages do not insure preservation of the health of its inhabitants unless there is also careful supervision of all matters of hygiene and sanitation.

From a public health standpoint the more important sources of disease are individuals sick with or recovering from communicable diseases, "carriers," impure and improper food, infected milk, polluted water, improper disposal of the human wastes, diseases arising from occupational environment, diseases transmitted from animals, and diseases of heredity. Efforts directed toward the improvement and safeguarding of the public health must, therefore, take cognizance of all these as well as other factors.

TUBERCULOSIS.

The records of the State registrar of vital statistics show that for the year 1919 there were 1,104 deaths from all forms of tuberculosis; in 1920 there were 1,253 deaths; 21.90 per cent in 1919 and 23.53 per cent in 1920 of all deaths in the State were due to tuberculosis. As has been previously shown in this study, it is thought fair to assume that in 77 per cent of all deaths from this cause occurring in Arizona the disease was contracted elsewhere. After making this correction, it appears that the correct death rate per 1,000 for cases of tuberculosis contracted in Arizona for 1919 is 0.76; in 1920, 0.87. The crude annual death rate per 1,000 from tuberculosis for 1919 is 3.27, and for 1920, 3.74.

The number of cases of tuberculosis in the State is not known. The rejection of draft registrants from Arizona because of tuberculosis was 66.58 per 1,000. When it is considered that a majority of the white persons in the State who are native Americans, but not natives of the State, have come to the State because of their own health or the health of some member of their family, it can be realized what a large number of active cases are present in the State. In passing it may be well to note that most of the foreign-born whites are employed in or around the numerous mining camps or smelters. Although a certain number of the foreign-born whites do come to Arizona as health seekers, the percentage is small.

The morbidity reports on tuberculosis are entirely inadequate. The director of surveys and inspections of the State board of health has conducted several surveys in different towns of the State with reference to various aspects of the tuberculosis problem.

Data at hand based on these surveys show that in the city of Phoenix in a canvas of 1,003 homes in all sections of the city there were 481 known cases of tuberculosis. This canvass did not include any tuberculosis camp or sanatoria. The results of this particular canvass may be further classified as follows:

Duration of residence in Arizona:

Less than 1 year	259
1 to 3 years	98
3 to 5 years	33
5 years and over	91
Total	481

Distribution by sex:

Adults—	
Male	260
Female	171
Children—	
Male	28
Female	22
Total	481

Distribution by race:

White	428
Mexican	35
Negro	18
Total	481

In the city of Tucson a similar canvass was made, except a larger number of homes were visited, but unfortunately the exact number was not noted: 969 known cases of tuberculosis were recorded. None of the numerous camps or sanatoria were included; however, all parts of the city were visited. The Tucson cases are classified as given below:

Duration of residence in Arizona:

Less than 1 year	401
1 to 3 years	207
3 to 5 years	174
5 years and over	187
Total	969

Of the 969 cases, 38 specified Arizona as the place where disease was contracted.

Distribution by race:

White	822
Negro	28
Mexican	106
Indian	13
Total	969

In addition to the 969 known cases of tuberculosis recorded in this survey, 1,111 persons were found who had come to Tucson as health seekers for other reasons than known tuberculosis.

Classification of health seekers other than known tuberculous:

Influenza convalescents	570
Pneumonia convalescents	108
Bronchitis	76
Asthma	139
Empyema	2
Enlarged glands with suspected tuberculosis	32
All other conditions	184
Total	1, 111

Two thousand active cases of pulmonary tuberculosis is a very conservative estimate for Tucson.

The canvass made at Prescott showed 244 known cases of tuberculosis out of 1,121 persons interviewed and 332 homes visited in various parts of the town. No sanatoria or camps were included in this. The tabulation by residence and race is as follows:

Duration of residence in Arizona:	
Less than 1 year	92
1 to 3 years	53
3 to 5 years	20
5 years and over	79
Total	244

Distribution by race:	
White	185
Mexican	51
Negro	8
Total	244

Although many of Arizona's useful citizens came to the State as health seekers, and are now arrested cases, the economic burden placed upon the various communities by indigent tuberculous persons from other States is indeed quite serious. Many sick people reach Arizona who have only enough funds to sustain them for a short time: some come without any funds: numbers become dependent after a year or two. Physicians in other States little realize the load they place upon Arizona communities when they advise persons who are penniless or without sufficient means to seek health in this climate.

Arizona is desirous of sharing her splendid climate with all health seekers, but, quite naturally, does not care to acquire additional financial burdens while assisting those from other States in searching for health within her borders.

The prevalent popular idea that the climate of the arid Southwest alone can effect an arrest of pulmonary tuberculosis is difficult to eradicate. The climate is beneficial, but the usual régime of nutritious food, enforced rest, and careful medical supervision is as necessary for arresting tuberculosis in Arizona as elsewhere.

There are a number of private hospitals, sanatoria, and camps for the treatment of tuberculosis, but neither the State of Arizona nor any of the counties have provided public hospitals for the care of the tuberculous. Such a step would be an invitation to many indigent sufferers in other States. Six of the counties maintain hospitals for the care of the indigent sick and disabled of the county. The capacity of these general hospitals varies from 20 to 40 beds. All of the county hospitals provide a small number of beds for tuberculous patients. The other eight counties take care of sick indigents, including the tuberculous, by placing them in some hospital located in the county. Hospitals receiving such cases usually give the county a special rate.

A general health clinic is in operation in the two largest cities of the State—Phoenix and Tucson. Each of these health clinics is maintained by the cooperative efforts of local welfare societies and organizations interested in the control of tuberculosis. At these clinics persons unable to pay may receive free out-patient medical care, and in some instances, medicines. A number of tuberculous persons are given medical consultation and advice at these clinics.

Local physicians contribute their services to the health clinics. The State board of health contributes a part of the salary paid to one of the nurses employed at one of the clinics.

The more the tuberculosis problem in Arizona is studied the more plainly it appears to be a vast social and economic problem, as well as one of public health. The penniless health seeker who must have immediate financial assistance in order to obtain even the barest necessities of life is more a social or welfare problem than a matter for the attention of the health authorities.

The fact is well known that the North American Indian is very susceptible to pulmonary tuberculosis. There were in 1920 32,989 Indians in Arizona, of whom the greater number live on the several Government reservations. There are no recent statistics available for use in this study in estimating the prevalence of tuberculosis among the Arizona Indians.

In 1912, however, the United States Public Health Service made an investigation of the prevalence of trachoma, tuberculosis, and smallpox among the Indians of the United States. As a result of this investigation (published as Senate Document No. 1038) it appeared that, in Arizona, in 1912, out of 5,873 Indians examined, there were 114 cases of tuberculosis; namely, pulmonary 52, glandular 54, osseous 6, and other forms 2. A considerable proportion of the Indians examined, however, were boarding-school children. These had a low tuberculosis rate, as children with tuberculosis were excluded from the schools. The rate of infection seemed to vary in different parts of the State from 1.5 per cent among the White River Apaches to 14.6 per cent among the Walapai Indians.

Tabulation of deaths occurring in Arizona from all forms of tuberculosis in 1919 and 1920 with reference to State or country in which disease was contracted.

State or country.	1919			1920		
	Male.	Female.	Total.	Male.	Female.	Total.
Arizona	174	64	238	143	94	237
Alabama	4	1	5	2	3	5
Arkansas	6	2	8	10	3	13
California	34	28	62	29	20	49
Colorado	6	1	7	3	....	3
Connecticut	....	....	....	2	1	3
Florida	3	1	4	2	1	3
Georgia	3	1	4	6	3	9
Idaho	2	1	3	2	2	4
Illinois	23	9	32	21	15	36
Indiana	4	3	7	8	10	18
Iowa	3	1	4	7	1	8
Kansas	13	3	16	6	7	13
Kentucky	3	3	6	6	3	9
Louisiana	2	1	3	2	....	2
Maine	....	....	....	1	....	1
Massachusetts	1	1	2	2	1	3
Michigan	7	4	11	12	5	17
Minnesota	8	4	12	4	4	8
Mississippi	2	2	4	2	2	4
Missouri	17	9	26	16	10	26
Montana	5	4	9	6	1	7
Maryland	1	....	1	1	....	1
Nebraska	4	1	5	4	3	7
Nevada	....	1	1	1	....	1
New Jersey	1	1	2	4	2	6
New Mexico	2	1	3	3	2	5

Tabulation of deaths occurring in Arizona from all forms of tuberculosis in 1919 and 1920, with reference to State or country in which disease was contracted—Continued.

State or country.	1919			1920		
	Male.	Female.	Total.	Male.	Female.	Total.
New York	12	6	18	19	2	21
North Carolina	2	2	4	2		2
North Dakota	2		2	1		1
Ohio	13	7	20	20	7	27
Oklahoma	4	4	8	13	11	24
Oregon	5	1	6	13	2	15
Pennsylvania	12	4	16	14	5	19
Rhode Island	1		1			
South Carolina					1	1
South Dakota	2		2	2	3	5
Tennessee	9	3	12	7	4	11
Texas	19	12	31	12	6	18
Utah	2	1	3	1	1	2
Virginia	2		2	4		4
Washington	3	1	4	4		4
West Virginia	1	1	2	3	1	4
Wyoming	3	1	4			
Wisconsin	1		1	4	2	6
Alaska	2	1	3			
Army and Navy	7		7	35		35
District of Columbia	1		1	1	2	3
Mexico	11	12	23	13	8	21
Canada	1	1	2	1	3	4
Australia	1		1			
Austria				1		1
England				1		1
France				8		8
Ireland				2		2
Norway	1		1			
Spain				1		1
Sweden	1		1	1		1
Unstated	311	143	454	373	141	514
Total	757	347	1,104	861	392	1,253

Death rates from tuberculosis per 100,000 in Arizona in 1919, according to age and sex.[1]

Age groups.	Both sexes.	Male.	Female.
0 to 14 years	39	49	30
15 to 24 years	321	335	303
25 to 34 years	525	572	450
35 to 44 years	643	763	438
45 to 64 years	437	485	344
65 years and over	409	477	303

[1] Rates based on 1910 age distribution of population applied to estimated population of July 1, 1919.

Deaths from tuberculosis in Arizona for 1919, according to length of residence in the State.

Residence in Arizona.	Male.	Female.	Total.	Residence in Arizona.	Male.	Female.	Total.
1-3 months	152	64	216	7-9 years	45	27	72
3-6 months	47	31	78	10 years and over	90	39	129
6-12 months	49	29	78	Unstated	222	81	303
1-3 years	112	52	164				
4-6 years	40	24	64	Total	757	347	1,104

Deaths in Arizona from tuberculosis in 1919, according to race.

White	776	Others	55
Mexican	256		
Indian	17	Total	1,104

Comparison of tuberculosis death rates per 100,000 in Arizona in 1920 with those in registration area, by age and sex.[1]

Age groups.	Both sexes.		Male.		Female.	
	Arizona.	Registration area.	Arizona.	Registration area.	Arizona.	Registration area.
0 to 14 years	35	43	33	42	38	45
15 to 24 years	470	106	471	86	469	125
25 to 34 years	599	160	677	157	475	164
35 to 44 years	624	161	743	182	420	139
45 to 64 years	295	162	366	199	155	126
65 years and over	776	179	985	200	450	149

[1] Rates based on 1910 age distribution of population applied to estimated population of July 1, 1920. The death registration area used includes the 24 States which were in the area in 1915 and has a population of about 65,000,000. The death rates were originally calculated for the age groups 0 to 9, 10 to 19, 20 to 29, etc.; the values for the age groups used above were determined graphic interpretations and these are approximately correct.

Deaths from tuberculosis in Arizona for 1920, according to length of residence in the State.

Residence in Arizona.	Male.	Female.	Total.	Residence in Arizona.	Male.	Female.	Total.
1-3 months	237	86	323	7-9 years	21	10	31
3-6 months	57	31	88	10 years and over	87	45	132
6-12 months	54	28	82	Unstated	242	92	334
1-3 years	123	76	199				
4-6 years	39	25	64	Total	860	393	1,253

Deaths from tuberculosis in Arizona for 1920, according to race.

White	853
Mexican	254
Indian	20
Others	42
Unstated	84
Total	1,253

TYPHOID FEVER.

Forty-four deaths from typhoid fever were reported in 1919, and 33 in 1920. Estimating the mortality rate as 10 per cent, it would seem that 440 cases of typhoid fever occurred in 1919, and 330 cases in 1920. Morbidity returns give 44 cases as having been reported in 1919 and 87 cases in 1920. It is evident that a number of cases of typhoid are not recognized as such, and that physicians are very careless about reporting cases.

DIPHTHERIA.

Deaths due to diphtheria during 1919 were reported as 21; during 1920, 27 were reported. Reports were made of 47 cases in 1919, and 90 cases in 1920.

Most States have some arrangement whereby diphtheria antitoxin is furnished at a reduced price, and free of cost to those unable to pay. Arizona should adopt a similar plan. The antitoxin should be distributed at designated points throughout the State so as to be available in all sections and in remote towns.

INFLUENZA.

There were 189 deaths reported in 1919 from influenza; 129 deaths from the same cause were reported in 1920. Only 3 cases of influenza were reported in 1919, but in 1920 the morbidity returns are much better, 1,736 cases being reported. This improvement in reporting influenza is gratifying and gives an idea of the cooperations physicians can lend when the necessity and importance of reporting a given disease is brought to their notice.

ACCIDENTS.

Deaths from accidents of all cases numbered 246 in 1919; for 1920 the number was 236. Accidents occurring in mines and quarries contributed the largest number of deaths due to any particular occupation or place of employment. There were 47 fatal accidents in mines and quarries in 1919 and 42 in 1920.

Mining is a very extensive industry in Arizona, hundreds of men being employed in the various mining operations. At practically all of the mines, except the very small places, systematic efforts are made to reduce the number of accidents and to instill into the miners the principle of "always be careful." The chief causes of fatal accidents in metal mines (there are no coal mines in Arizona) are as follows:

	Per cent.		Per cent.
Falls of roof	30	Falls of persons	13
Explosives	14	Electricity	4
Haulage	13		

PHYSICAL DEFECTS AND DISEASES REVEALED BY THE SELECTIVE SERVICE DRAFT EXAMINATIONS.

Many important facts relating to the public health were brought to the attention of sanitarians and health officers by the results of the selective-service physical examinations. The predominance of certain diseases, even though some of them are not communicable, and the prevalence of various physical defects in the general population, are as much matters concerning the public health as the sudden appearance of an epidemic disease.

The United States War Department has compiled statistical information showing the physical condition of the men registered and examined in pursuance of the requirements of the selective service act. The statistics cited below relating to the defects and causes of rejection found in men examined from Arizona were obtained from "Defects found in drafted men," issued by the United States War Department.

The average number of rejections for the United States was 463.21 per 1,000. The highest rate for any State was 640.48 per 1,000; the lowest, 354.35 per 1,000. The average for Arizona was 410.01 per 1,000, or the eighth State for the fewest rejections—a very creditable showing.

From Arizona 11,527 men of military age were examined; 1,432 were rejected physically by the local boards; 1,969 were rejected at camp. The total rejections because of physical defects or presence of diseases rendering unfit for military service, 3,401.

Men examined	11,527
Rejected by local boards	1,432
Rejected at camp	1,969
Total rejections	3,401

The most striking fact brought out by the examinations is the high proportion of tuberculosis found among registrants; 717 men, or a ratio of 66.58 per 1,000, were rejected because of tuberculosis. This is the highest ratio per 1,000 for tuberculosis found in any State. A much larger proportion of lung defects was found in the southern part of the State (which includes the city of Tucson) than in the northern section. The rate for venereal diseases is 48.20 per 1,000, as compared with 40 per 1,000 for the United States at large.

The mental deficiency rate appears to be low; in fact, Arizona had fewer rejections for this cause than any other State. Only 25 men, or a ratio of 2.32 per 1,000, were rejected for mental deficiency, as compared with 17.14 per 1,000 for the whole population of the United States.

Valvular diseases of the heart were found in about 23.50 per 1,000, as contrasted with 33 as an average for the other States.

The rate for defective and deficient teeth is low, 3.38 per 1,000. 13.50 per 1,000 is the average for all other States.

Hernia and enlarged inguinal rings are quite common, being 43.64 per 1,000; the average for the United States is 39.92 per 1,000.

Malunion of fractures was found to be relatively higher in the section where the majority of the Indian population resides. The northern, or Indian section, showed a markedly low percentage of foot defects.

WORK OF CHILD WELFARE BUREAU.

The child-welfare bureau of the State board of health is under the direction of a full-time employee. The child-welfare work is directed chiefly along the following lines of activity:

1. Sending out cards, advising parents that a certificate of birth of their child has been filed with the State registrar of vital statistics. This was begun on January 1, 1920.

2. Follow-up work on birth certificates in obtaining supplementary reports of names of children who are reported as unnamed on the certificate of birth.

3. Addresses before various clubs and organizations for the purpose of giving instruction in the care of children as well as stimulating interest in child-welfare work. The appropriation available for defraying traveling expenses to make such addresses is small; hence this field of activity is restricted.

4. Furnishing charts and literature on the care of children for better babies contests, also posters and pamphlets to public-health nurses and school nurses.

5. Acting as supervisor for better babies contests at Arizona State Fair, held at Phoenix each year.

6. Forwarding literature on the care of children to various organizations interested in child hygiene, also to individuals on request.

Several leaflets on the care of the baby have been printed in Spanish for use among the Mexican population. Pamphlets and leaflets in English are also available for distribution.

Previous mention has been made of the fact that apparently the follow-up work of birth certificates is more properly the duty of the bureau of vital statistics. The director of child welfare, although not a nurse, is a mother, and performs efficiently the work mentioned above. It is believed, however, that certain advantages would be gained by employing a director with special training in public-health nursing and child hygiene. This would permit the expansion of the work to include public-health nursing as well. A more liberal appropriation for traveling expenses to be used in carrying forward this work is badly needed.

VENEREAL DISEASE CONTROL.

Venereal disease control work by the Arizona State Board of Health was begun in July, 1919, when a bureau for this purpose was established. The work of the bureau is largely educational, although three clinics are in operation and arsphenamine has been distributed for use in a number of counties.

The bureau has cooperated with the Federal health agencies interested in venereal disease control and has received Federal financial aid for the prosecution of its work.

The educational work consists of the distribution of literature, lectures, and the use of exhibits; and 10,948 pamphlets dealing with the subject of venereal disease control have been distributed since the beginning of this work in the State. The distribution of this literature was accomplished in cooperation with the United States Public Health Service. Ten lectures on venereal disease control were delivered during 1920 in different communities. A poster exhibit is used when the opportunity is afforded at fairs and similar gatherings.

One special venereal disease clinic is maintained in the city of Douglas under the personal supervision of the director. In Phoenix and Tucson free general health clinics are maintained by local welfare organizations. The venereal work at each of the general health clinics is done in cooperation with the bureau of venereal disease control. In addition to the work of these clinics, arrangements have been made with the city health officers of several other towns whereby indigents receive free treatment for venereal diseases.

Arrangements are also effective for the distribution of arsphenamine to those unable to pay for it, and 265 doses of arsphenamine were distributed by the State board of health in 1920.

Provision for free laboratory examinations for the diagnosis of venereal diseases is also in effect. These examinations are made at a private diagnostic laboratory, and the expense is borne by the State board of health. The amount of such laboratory work is quite small. Much wider publicity should be given to the fact that this work is done without cost.

An amendment to the regulations of the State board of health, governing the reporting of communicable diseases, was adopted January 11, 1918, adding venereal diseases to the list of reportable diseases and specifying the method of reporting and controlling such diseases. There has been an encouraging response on the part of physicians in the matter of reporting venereal diseases. Although perhaps only a small percentage of the cases of venereal diseases is being reported, yet the total of cases reported for 1920 is 113 more than were reported in 1919. In 1919 a total of 353 cases of venereal disease was reported; 466 cases were reported in 1920.

The director of the bureau of venereal disease control is also full-time health officer for the city of Douglas. This is a handicap, in that Douglas is 234 miles from Phoenix, the location of the State board of health, and the duties as city health officer necessarily demand the greater portion of his time. More vigorous efforts should be made toward the establishment of other venereal disease clinics, more comprehensive arrangements should be made for laboratory diagnosis of venereal diseases, and attention should be given to the matter of law enforcement with reference to suppression of prostitution.

DIAGNOSTIC LABORATORY.

The State board of health has no diagnostic laboratory. For a short time the laboratory of the Arizona State Insane Hospital performed a certain amount of diagnostic work (chiefly venereal disease specimens) for the State board of health. This plan has been discontinued. As has been previously stated, the venereal disease laboratory diagnostic work is at present being done by a private laboratory in Phoenix. The venereal disease diagnostic specimens are few in number. A total of not more than 12 or 15 specimens has been examined by the private laboratory under the plan above mentioned.

The State board of health has no arrangements with any laboratory for the performance of important public health diagnostic work, such as examinations of cultures from suspected diphtheria cases, or specimens of blood from typhoid fever suspects, or animals thought to be infected with rabies, nor has it a Pasteur institute nor any provision for the free treatment of persons bitten by rabid animals.

One of the most urgent needs of the Arizona State Board of Health is the establishment of a State diagnostic laboratory. A diagnostic laboratory is the means not only of providing an aid in diagnosis to the physicians throughout the State, but it is an invaluable weapon in protecting the public health. Epidemics of diphtheria can be checked if laboratory cultures are made in all suspected or doubtful cases. Without a laboratory confirmation many cases of typhoid fever may go unnoted; consequently, the necessary precautions are not taken to prevent its spread to other members of the household or community. The same thing applies to a number of other diseases.

It is of immeasurable assistance to the physicians of a State in arriving at a correct diagnosis in doubtful, obscure, or ill-defined conditions. From a public health standpoint, a diagnostic laboratory is indispensable for the proper preservation of the health and lives of the inhabitants of any State. A State diagnostic laboratory is of mutual benefit to health officers, physicians, and the public at large.

There is located at Tucson an establishment designated as the State laboratory. This State laboratory occupies quarters in one of the buildings on the campus of the University of Arizona.

The relation of the State laboratory to the State board of health and the University of Arizona is not clearly defined by law, nor is this relation thoroughly understood by the officials themselves. The law provides that the director of the State laboratory shall be selected by the board of regents of the University of Arizona, acting in joint session with the superintendent of public health. The law further requires that the State laboratory be located in rooms set aside for that purpose by the University of Arizona.

The director is required, under the act establishing the State laboratory, to perform all duties prescribed by law and by the board of regents of the University of Arizona, acting in joint session with the superintendent of public health.

It would therefore appear that the director of the State laboratory is responsible jointly to the board of regents of the university and to the superintendent of public health. In practical operation the matter works out on the principle of what is everyone's business is no one's business, and the director is left to work out his own plans as to how the laboratory should be conducted and what work should be done.

The State laboratory and the office of director were established by the act, having for its purpose the protection of food and drink, popularly known as "Arizona pure food law." Therefore, the chief work of the laboratory is the chemical and bacteriological examination of foodstuffs and water supplies. A small amount of diagnostic work is done, practically all of which is for local physicians in Tucson.

The present State laboratory could very easily be converted into a diagnostic laboratory without interfering with the present duties in connection with the food work, and with very small additional expense. The quarters are ample for the addition of the diagnostic work; the director is well qualified as a diagnostic bacteriological and pathological technician. An additional assistant bacteriologist would, of course, be necessary.

The only objection to using the present State laboratory is that Tucson is not the railroad center of the State. It would be rather far removed for specimens from the northern part of the State. As a matter of fact, there is no railroad center for Arizona. Phoenix, although near the geographical center of the State, has only two railroads, neither of which are main lines.

Should the State laboratory be utilized as a diagnostic laboratory, in addition to the food examinations now being performed, the law should be amended so as to place the director and the State laboratory under the immediate supervision of the State board of health.

LOCAL HEALTH AUTHORITIES.

REQUIREMENTS OF LAW.

The law relating to the formation of local boards of health may be summarized as follows:

The county board of health is composed of the chairman of the county board of supervisors, the county attorney, and a superintendent of public health. The county superintendent of public health is appointed by the county board of supervisors for a term of two years. The county board of health is required by law to meet as often as once every three months.

The county boards of health have power in their respective counties, outside of the corporate limits of cities having a city board of health, subject to the supervisory control of the State board of health and the State superintendent of public health.

The powers and duties of a county board of health are as follows:

1. To fix a time and place for the meetings of the board, subject to the provisions of existing law.

2. To make rules and regulations for the government of the board, its officers, and meetings.

3. To make and enforce all needful rules and regulations for the prevention and cure, and to prevent the spread of any contagious, infectious, or malarial diseases among persons and domestic animals.

4. To establish quarantine, and isolate any person affected with any contagious or infectious or epidemic and endemic disease.

5. To isolate, kill, or remove any animal affected with contagious or infectious disease when necessary to protect the public health.

6. To remove, or cause to be removed, any dead, decaying or putrid body, or any decayed, putrid, or other substance that may endanger the health of persons or domestic animals.

7. To condemn or cause to be destroyed any impure or diseased article of food that may be offered for sale.

8. To empower and direct the county superintendent of public health to do, or cause to be done, any and all of the things mentioned in subdivisions 4, 5, 6, and 7.

9. To make such rules and regulations as it may deem necessary to govern the preparation of dead bodies for transportation, and to govern what classes of dead bodies may be transported and the manner thereof.

10. To have charge of the vital statistics registration within the county, and to supervise the uniform and thorough enforcement of this law.

11. To render to the State board of health such reports as are required by law and regulations.

The president and the vice president of the board receive no compensation, but are paid 10 cents for every mile actually and necessarily traveled in the performance of their official duties, and other necessary expenses incurred by them.

The county superintendent of public health, who is required to be a practicing physician within the county, is paid such compensation as the board of supervisors may fix, provided that he shall receive not to exceed $300 per annum, and not to exceed $10 a day when actually and necessarily engaged, and not to exceed 10 cents a mile for each mile actually and necessarily traveled.

The county superintendent of public health is also named by law as county registrar of vital statistics, and for such duties is allowed the sum of $300 per annum.

All expenditures for the county board of health must be authorized by the county board of supervisors before being made. Expenses are certified to by the board of supervisors and are paid as other county bills.

The regulations of the State board of health prescribe the reports that are to be made by the county superintendent of public health to the State superintendent of public health.

Each incorporated city is required to have a city board of health, to be constituted as follows: The mayor appoints two members of the city council, who with the city engineer and the city health officer compose the city board of health. The city health officer is appointed by the mayor and approved by the council, and serves for a term of two years. He is required to be a practicing physician of the city and is paid such salary as the city council may fix. The city health officer is required to give bond in the sum of $1,000 as a guaranty for the faithful performance of his duties.

The powers and duties of a city board of health are similar to those enumerated for the county boards of health. Specific authority is given city health officers to enforce ordinances relating to sanitary matters. It is the custom to appoint the city health officer as local registrar of vital statistics. Both county and city boards of health are known as local boards of health.

According to law only local boards of health can enter court and begin action for violation of health laws. This is a decided disadvantage as it prevents any action by the State board of health in case local authorities refuse, neglect or fail to properly perform their duties.

A justice of the peace within the jurisdiction of a local board of health, upon complaint of such board, may issue a warrant to the sheriff or other peace officer, commanding him to take sufficient aid and, accompanied by at least one member of the local board of health, between the hours of sunrise and sunset, to remove or destroy any nuisance, source of filth or cause of sickness.

Persons violating requirements of the health laws are liable to a fine of not less than $10, or more than $50, or to imprisonment in the county jail not exceeding 30 days, or both. Violations of rules and regulations of local boards of health are defined as misdemeanors and the punishment is stated as a fine not exceeding $100, or by imprisonment in the county jail not exceeding 30 days, or both. Physicians convicted of violations of the health laws and regulations shall have their license to practice revoked.

Local boards of health are authorized to examine into all nuisances, sources of filth and causes of sickness, to abate nuisances, establish temporary hospitals for contagious diseases, investigate contagious diseases, regulate handling and transportation of dead bodies, exclude cases of communicable diseases from attending any public or private school, destroy bedding or clothing exposed to infection from contagious or infectious diseases, and maintain quarantine of contagious or infectious diseases.

The State board of health has superintending control of all local boards of health.

The activities of the local health authorities in several towns of the State are briefly summarized below:

PHOENIX.

Population, 29,053.

The city of Phoenix, although the largest town in the State, has no full-time health officer. The present incumbent is a physician engaged in the active practice of medicine. The personnel of the city health department is as follows:

City health officer (part time), paid by city.
Sanitary inspector (whole time), paid by city.
Milk inspector (half time), paid by city.
Visiting nurse (whole time), paid by local Red Cross.

The duties performed by the city health officer, in addition to directing the work of the other employees, consist of control of communicable diseases, local registrar of vital statistics, and supervision of abatement of nuisances and complaints.

The sanitary inspector, who has the power of a police officer, investigates complaints of nuisances, conducts inspections of restaurants and cafés and placards houses for quarantinable diseases. The city has a pesthouse for isolation of smallpox cases.

The work of the milk inspector consists of the inspection of all dairies selling milk in the city, and the collection of milk samples for examination. Only half time is given to the duties as milk inspector; the remainder of the time is devoted to the duties as city inspector of weights and measures. There is a city ordinance, regulating the sale of milk, but the pasteurization of all milk is not required.

A visiting nurse, paid by the local Red Cross, working under the supervision of the city health department, assists in looking after cases of communicable diseases, gives instruction in child hygiene, and does educational work in matters of hygiene and sanitation.

Through an arrangement with a private pathological laboratory, all specimens of water supplies, nose and throat cultures, milk samples, and blood tests for typhoid fever, are performed without charge to the individual. The city pays a fixed sum for this laboratory work.

The total annual expenditures of the city health department of Phoenix, including the amount paid for laboratory work, are $8,000. Further expansion of the activities and personnel of the city health department is obviously necessary. The most vital need is a city health officer paid a sufficient salary to enable him to give all of his time to the duties of the office.

TUCSON.

Population. 20,292.

The city health officer of Tucson is a practicing physician and devotes only a part of his time to the duties of the office. There is a deputy health officer who acts as sanitary inspector and is vested with the authority of a police officer. The city health officer supervises the reporting and quarantining of communicable diseases, directs the sanitary inspector, and is local registrar of vital statistics.

The chief work of the sanitary inspector consists of investigating complaints, collecting milk samples for examination, inspecting restaurants and soda fountains, and the placarding of houses for presence of communicable diseases.

There is a city ordinance, regulating the sale of milk within the city, and requiring tuberculin testing of all cows whose milk is offered for sale. The sale of milk containing more than 250,000 bacteria per cubic centimeter is unlawful.

Examination of milk samples collected by the inspector of the city board of health is made at the State Laboratory, which is located on the campus of the University of Arizona at Tucson. The city of Tucson expends about $3,500 annually for salaries of the city health officer, sanitary inspector, and incidental expenses.

DOUGLAS.

Population, 9,916.

The only city in the State having a whole-time health officer and maintaining a well organized health department is Douglas. The town is located in close proximity to the international border between the United States and Mexico. One of its main streets runs squarely to the line marking the limits of the United States.

The personnel of the city health department is composed of the following, all of whom are whole-time employees:

	Per annum.
City health officer (additional compensation is received from State board of health for services as director of bureau of venereal disease control)	$3,600
Laboratory technician	3,000
Community nurse	1,800
School nurse	1,800
Sanitary inspector	1,620
Total	11,820

The salary of the school nurse is paid by the school board; the laboratory technician is paid from fees received for laboratory work done for several large industrial plants located in the city. One-half of the salary of the community nurse is paid by the welfare league, a local welfare organization. Therefore, the city of Douglas pays $6,120 of the total of $11,820 expended annually for the city health department, the remaining $5,700 being derived as above mentioned.

The city health officer has direction of the work of the city health department and performs the following duties: Medical inspection of all school children, except high-school students. About 4,000 children are inspected during each school year. Has charge of the detention hospital: smallpox cases, and prostitutes suspected of being infected with venereal disease are cared for at this hospital; conducts free venereal disease clinic; makes inspections of all dairies selling milk in town: inspections of water supplies; performs smallpox vaccinations without charge; local registrar of vital statistics. The city health officer has also secured the cooperation of local surgeons in conducting a free surgical clinic for school children needing surgical attention but who are unable to pay for such treatment.

The laboratory of the city board of health is adequately equipped and well conducted. All ordinary laboratory work, except examination of tissue specimens, is done. All work for the city is done free: this includes indigents of the city. The county pays for work done for those living out of the town, who are unable to pay. Fees are charged for private work. The greater part of the private work comes from the hospitals maintained in Douglas by several large industrial companies (smelters). The salary of the technician and the maintenance expenses of the laboratory are paid by the fees from private work.

Tabulation of specimens examined at Douglas City laboratory during 1920.

Blood counts	224	Spinal fluid	1
Blood typing	9	Throat cultures	41
Blood coagulation time	1	Tissue (sent to El Paso, Tex.)	24
Dairy milk	144	Vaccines	27
Guinea pig inoculations	5	Urine	548
Feces	16	Wassermann reaction	722
Gastric analyses	13	Widal reaction	10
Pneumonia typing	3	Water examinations	20
Mothers' milk	12		
Smears	142	Total number specimens	1,962

Under the present arrangements the laboratory could not be maintained without the fees from private work. There is no objection to a laboratory doing private work, provided the original purpose of protecting the public health is always kept clearly in view. A laboratory that is supported by fees from private work quite naturally will give preference to such work. The city laboratory of Douglas could be made of a great deal more service to the inhabitants of the vicinity by performing all laboratory examinations without charge, for persons residing in the town. Fees could be accepted for work done for the industrial hospitals.

The community nurse acts as a visiting nurse, assists in caring for indigent sick, gives instruction in child hygiene, distributes educational literature, and aids the city health officer in any additional work as required. This nurse also keeps a check on the placarding of communicable diseases and observance of quarantine.

The duties of the school nurse consist of helping in medical inspections of school children, looking after follow-up treatment in children found to have defects requiring attention, and making inspections regarding sanitary conditions in school buildings. Instruction in hygiene is also given by this nurse.

The sanitary inspector has supervision of the collection of the city garbage; he also placards houses for communicable diseases, does fumigation work when required, and collects specimens of milk for examination. The sanitary inspector, in addition to the above-enumerated duties, has charge of the city detention hospital. He also investigates complaints of nuisances.

Among the ordinances enforced by the city health officer is one requiring the tuberculin test on all dairy cows before issuing a permit to sell milk.

BISBEE.

(Population, 9,205.)

The city health officer of Bisbee is a part-time official. He performs the sanitary inspection work, quarantine duties, and acts as local registrar of vital statistics. In addition to the city health officer, Bisbee has a bacteriologist and city school physician. The physician, who is bacteriologist and school physician for Bisbee, is also county superintendent of public health, and devotes all of his time to the duties just mentioned, including duties as registrar of vital statistics.

This county superintendent of public health does not engage in private practice but devotes all of his time to public-health duties. Most of his time is taken up as bacteriologist and school physician for the city of Bisbee; the remainder is given to the county-health work.

The county health work will be first considered. All laboratory work for the county having a bearing on public health is done free of cost. This includes examinations of water supplies, milk samples, throat cultures, and blood in typhoid suspects. A rural-school nurse visits all the schools in the county, except those of the two largest towns, Bisbee and Douglas, for the purpose of inspecting children for detection of the more apparent physical defects. This nurse is provided with an automobile to enable her to visit all the rural schools. Inspection of school buildings and grounds, as well as valuable educational work in hygiene, is done by the rural-school nurse. During the last three months in 1920 the rural-school nurse inspected 912 children. The nurse is paid by the county school board.

The control of communicable diseases in the county and the duties of county registrar of vital statistics are also done as county health work.

As previously suggested, the greater amount of the work done is as city bacteriologist and city school physician rather than the county health work. The work of city bacteriologist consists of the usual routine laboratory examinations. All of the laboratory work is done free of charge.

Tabulation of specimens examined by public health laboratory of Bisbee, 1920.

Dairy milk	461	Sputum for tuberculosis	46
Cultures for diphtheria	14	Water examinations	94
Miscellaneous	57		
Blood for typhoid	11	Total specimens examined	683

The laboratory, although small, is well equipped and efficiently conducted. The work of the laboratory should be expanded and an assistant bacteriologist employed.

The duties performed as city school physician for Bisbee include inspection of school buildings and grounds, physical examination of teachers, medical inspection of pupils once annually, correction of physical defects, educational work in health matters, supervision of physical education and supervision of students engaged in athletics. A total of 4,851 school children was examined during 1920.

Assisting in the school work are school nurse, visiting nurse, and office clerk. The school nurse assists the school physician in making inspections of buildings and grounds, conducting physical examinations of school children and in administering the necessary treatment suggested for minor defects.

The visiting nurse does follow-up work in the homes and gives class instruction in hygiene to the school children. The office clerk performs all clerical work, including clerical work of the laboratory.

A dentist is usually employed by the school board to give part of his time to school inspection for a limited period each year.

Personnel.—County superintendent of public health, paid by county; city school physician for Bisbee, paid by school board; city bacteriologist for Bisbee, paid by city. (These are one individual—whole time.)

School nurse (whole time), paid by school board.

Visiting nurse (whole time), paid by local Red Cross.

Office clerk (whole time), paid by local Red Cross.

Rural school nurse (whole time), paid by county school board.

Dentist (part time), paid by school board.

The above described organization is rendering efficient service, but for the purpose of uniformity in administration, it appears desirable to combine the duties of city health officer with those of city bacteriologist and city school physician, and separate those entirely from the office of county superintendent of public health.

Matters of political expediency should have no bearing upon the effectiveness of public health administration.

There are, in addition to the activities of the local boards of health above described, about 30 public health nurses in different towns of the State. Sixteen of these are employed by local school boards, 4 by local chapters of the American Red Cross, 3 by county anti-tuberculosis associations, 1 by associated charities, 1 by welfare league, 1 by city council, and the remaining 4 by two or more of these agencies working jointly. These nurses, scattered in 30 towns and mining camps of the State, are carrying forward a very important work. Some of them are working in cooperation with the existing health authorities, many of them are not. There is urgent need for a public health nurse, representing the State board of health, to coordinate and cooperate with these public health nurses.

DISCUSSION.

A State health department, in order to do effective work, must be equipped to send trained experts to any part of the State at any time. Local health officers frequently need assistance and advice. The State health department is the logical place from which such aid should come. The epidemiological activities of any health department form a very important part of the work. The State health organization of Arizona should not only have a full time executive head, but whole time employees, trained in epidemiology, bacteriology, and sanitary engineering.

A mobile trained sanitary personnel is particularly needed by the State health department of Arizona because of the close proximity to Mexico, the constant shifting back and forth of a large Mexican population, and the ever present danger of introduction of some epidemic. Smallpox and typhus fever are prevalent in Mexico the year round. Bubonic plagué also has been reported in certain seaports and one interior town in Mexico.

The United States Public Health Service maintains an inspection of all persons entering the United States from Mexico at the three legal ports of entry in Arizona, Douglas, Nogales, and Naco.

The international border between Arizona and Mexico, as stated in the beginning of this study, is 335 miles long. There is very little hindrance to crossing the border at any place other than the three ports of entry above mentioned. Thus it can be readily understood how many Mexicans from the interior may cross the border into Arizona without being inspected or examined. Obviously, it is impossible to patrol the entire 335 miles of border.

From the standpoint of the State of Arizona, the best solution of the problem is to encourage the early reporting by any person, as well as physicians, of all suspected cases of communicable diseases, with special emphasis on smallpox and typhus fever. By having trained sanitarians available at all times, the State health department would be prepared to cope with any situation that might arise.

The work of the Arizona State Health Department should be conducted under four divisions—epidemiology, sanitary engineering, vital statistics, and laboratory. No epidemiological work of any consequence is now being done.

The State laboratory is of little service, save for the examination of foodstuffs and water supplies. This laboratory should be made an integral part of the State health department and its scope enlarged to include the examinations of specimens for typhoid fever, paratyphoid fever, tuberculosis, intestinal parasites, syphilis, gonorrhoea, malaria, and the bacteriological examination of milk and water. The proper city for the location of the laboratory is difficult to determine. It would doubtless be best to use the present State laboratory as the main laboratory and establish a small branch laboratory in conjunction with some county board of health in the northern part of the State to take care of the work from that section.

Practically no supervision is now exercised by the State board of health over the production, distribution, and handling of milk that is offered for sale. This important public health duty is delegated by law to the office of the State dairy commissioner. In no sense is the suggestion made that the State board of health take over all the duties of the State dairy commissioner. The work of fostering, encouraging, advising, and building up the dairy industry is entirely the work of the State dairy commissioner. But it does seem desirable to suggest that the sanitary supervision of dairies, producing milk to be offered for sale, be placed under the State board of health. Milk is the universal food, and its care and protection is distinctly a problem for the health authorities. An official who is trying to foster the dairy industry and keep the good will of all dairymen can not at the same time require a sufficiently high sanitary standard to properly safeguard the interests of the public health.

Proper inspection of milk in Arizona is doubly important because of the presence of a large number of active human cases of tuberculosis and because there is no State law or regulation requiring dairy cattle to be tuberculin tested.

For these reasons it is deemed wise to recommend that the State board of health be given supervision of the production, distribution, handling and storing of all milk offered for sale.

PUBLIC HEALTH ENGINEERING.

REQUIREMENTS OF LAW.

Obstruction of the free passage or use, in the customary manner, of any navigable lake or river, bay, stream, canal, or basin is declared to be a nuisance. The placing of any dead animal, or the offal from any slaughter pen, corral, or butcher shop into any river, creek, pond, reservoir, or stream is forbidden. It is a misdemeanor to place a water-closet, privy, carcass of any dead animal, or any offal of any kind in or upon the borders of any stream, pond, lake, or reservoir that is used as a public water supply, or to foul or pollute such water supplies in any other manner. Water-closets, privies, and cesspools are required to be kept in good condition.

The only supervision of the public water supplies throughout the State is that exercised by the director of the State laboratory in collecting samples for examination. There is no sanitary engineer attached to the State board of health and no attempt is made to perform the public health engineering work that should be done by a State health department.

The supervision of sewage and garbage disposal, water supplies, industrial wastes and studies of the housing problem in mining camps, in its relation to the public health, are among the duties that should devolve upon a sanitary engineer employed by the Arizona State Board of Health.

The existing law places investigations of public water supplies under the director of the State laboratory, an official over whom the superintendent of public health has practically no control. Such a plan is not satisfactory. The results of bacteriological examinations of water must be studied and interpreted by experts in connection with field investigations of the sources of the water. Any other procedure is worse than valueless. Any person may look at an X-ray plate and draw conclusions from it, but only the deductions drawn by one skilled in X-ray work are reliable or of any value. So it is with interpretation of water examinations.

The presence in the State of a large number of mining camps and industrial plants is an added reason for the necessity of a sanitary engineer for the State board of health.

INSPECTION OF FOOD AND DRINK.

The law relating to the manufacture, sale, or transportation of adulterated, mislabeled, or misbranded foods or liquors is similar to the United States Statutes on this subject. The standard of purity of food and liquor is expressly stated by law to be that proclaimed by the authorities administering the United States pure food and drug act.

The superintendent of public health is responsible for the enforcement of this law, to the extent that he shall cause examination and analysis of food to be made by the director of the State laboratory, and report violations to the county attorney. The actual enforcement of the law is left to the county attorney and sheriff in the county where the violation occurs. The superintendent of public health should be authorized to enter prosecutions for violations of this law or any other health law and not have to depend upon local county attorneys or local health authorities to begin legal action.

INSPECTORS.

There are no provisions or appropriations for inspectors to collect samples of food or drink for examination in the enforcement of the law. Neither are there inspectors for investigating violations of the law. The director of the State laboratory is obliged to go out and collect samples personally, investigate such violations as may seem apparent, and then return to the laboratory and perform the examinations of the samples secured. The appropriation available for traveling expenses is quite small, hence the work necessarily is limited. At least two food inspectors with adequate traveling allowances are needed for the reasonable enforcement of the "Pure food law."

The present "Pure food law" would be rendered more efficient by the addition of a seizure provision by which suspicious foodstuffs could be held, pending further investigation or court proceedings. An amendment is also needed, permitting inspections of all places handling or storing food products offered for sale, and authorizing the issuing of regulations governing the handling, care and storing of food products.

The personnel of the State laboratory with their annual salaries is as follows:

PERSONNEL OF STATE LABORATORY.

Director (full time), $1,800 per annum.
Bacteriologist (full time), $1,500 per annum.
Clerical assistant (part time), $300 per annum.

The laboratory is located on the campus of the University of Arizona in rooms set aside according to law for that purpose. This arrangement saves the payment of rental for quarters, and also provides electric, gas, and janitor service. The total annual appropriation for the maintenance of the State laboratory is $4,500. This appropriation is entirely separate and distinct from the appropriation of the State board of health. The State board of health has nothing to do with the expending of the appropriation for the State laboratory.

The salaries paid the director and bacteriologist are entirely too small for the responsibility involved and the work done.

Tabulation of expenditures of State laboratory for 1920.

Salaries	$3.046.86	Scientific books and journals	$44.97
Railroad fare	152.15	Express and freight	83.32
Stage fare	65.10	Laboratory supplies and equipment	268.02
Traveling expenses	383.93	Chemical supplies	50.08
Samples	33.33	Office supplies	42.07
General expenses	87.19		
Telephone	87.40		
Telegraph	30.55	Total expenditures	4,422.62
Ice	47.65	Total appropriation	4,500.00

Arrangements have recently been made whereby the State laboratory receives $25 monthly for examinations of milk made for the State dairy commissioner. This is applied to the payment of the salary of the bacteriologist.

ANNUAL REPORT OF EXAMINATIONS MADE BY ARIZONA STATE LABORATORY DURING 1920.

Character of examination or specimen.

	Specimens examined.
Laboratory investigations of water supplies:	
(*a*) Public water supplies	253
(*b*) Private water supplies	51
(*c*) Railroad water supplies	15
Field investigations and sanitary surveys of water supplies	15
Pure food inspections of grocery stores	127
Examinations for laboratory diagnosis	122
Bacteriological examinations of milk	214
Ice creams examined for butter fat	48
Analysis of suspected foods	64
Samples collected for United States food and drug inspection	15
Drug stores inspected for United States food and drug inspection	27
Total	951

The analysis of food and drink samples should be made under the direction of the official who is responsible for the enforcement of the "pure food law." That is, the superintendent of public health, who is responsible for the administration of the law, should have control of the laboratory where the analyses are done.

As has been repeatedly pointed out, the State laboratory should be expanded into a diagnostic laboratory and placed under the charge of the State board of health.

PUBLIC HEALTH EDUCATION.

The State board of health publishes quarterly a bulletin which is distributed throughout the State. The bulletin contains tabulations of vital statistics of the State, also articles dealing with health matters.

Several small leaflets, dealing particularly with the care of children, venereal disease control, prevention of tuberculosis, and the care of tuberculous persons have been issued. Two or three leaflets have also been printed in Spanish.

A few addresses are made from time to time during the year in various parts of the State by the director of the child welfare bureau and the director of the venereal disease control bureau. The State board of health owns two panel exhibits on public health subjects. These are used chiefly at fairs.

It is believed to be desirable for the State board of health to issue bulletins of a popular educational nature, dealing with the particular sanitary problems found in Arizona. When vital statistics are included in bulletins, some effort should be made to interpret their meaning so that the public may understand the lessons derived from and value of collecting such statistics. There is nothing so dry or uninteresting to the average person as vital statistics unaccompanied by an intelligent explanation.

The State board of health needs more publicity as to what it is doing and can do for the inhabitants of the State. Addresses on public health subjects should be given by a representative of the State board of health whenever an opportunity presents itself.

An effort should be made to place before the public as clearly as possible the difference between public health work and medical relief, or charity work. Much confusion over this rather difficult and widely misunderstood subject has already arisen.

HEALTH SUPERVISION OF SCHOOLS.

The law provides for the exclusion of children from school who have any dangerous, infectious, or contagious disease. Regulations of the State board of health also provide for the exclusion of children from school who are actually infected with certain communicable diseases not expressly mentioned in the law.

Other than the above the State board of health or local boards of health have no authority for health supervision of the schools. Most of the medical inspection work that is done in the schools is conducted under the authority of the local school boards. The law requiring compulsory vaccination before being allowed to attend any school was repealed after much agitation by the numerous antimedical cults.

The State board of health has issued a set of regulations regarding the proper construction of school buildings, as relating to heating, lighting, ventilation, toilet facilities, and water supplies.

About 16 county and city school boards employ school nurses for health supervision of school children.

The rural population of Arizona is scattered over a large area. Medical supervision of schools for the remote districts is difficult, because the schools are so widely separated. An amendment to the existing law permitting one or more towns or a county and one or more towns to combine their funds and employ a full-time health officer, would allow the formation of an adequate health organization in any county or towns desiring to do so. Proper health supervision of the schools would come as a natural consequence in the extension of public-health activities.

APPROPRIATIONS AND EXPENSES.

The appropriations of the various departments of the State of Arizona are made for a two-year period. The fiscal year of the State is from July 1 to June 30. The appended tabulation shows the available amounts for the State Board of Health, as specified in the appropriations bill. The total yearly amount appropriated by the State that may be expended is $19,700. This does not include $1,774 that is set aside annually from the general fund of the State for traveling expenses for the superintendent of public health only, or the amount that is received as Federal aid for venereal-disease control.

For the fiscal year ending June 30, 1920, the amount of revenue received by the State was as follows: Taxes, $5,596,390.68; other sources, $2,631,055.70; total, $8,227,446.38. The total yearly expenditures of the State were $6,847,090.37. The value of the taxable property in the State was $884,443,183. Estimating that adequate protection of the public health of a State requires an expenditure of 2 per cent of the State revenues, the State of Arizona should expend $175,000 annually for public health activities.

Tabulation of appropriations and disbursements of the State board of health for fiscal year ending June 30, 1920.

Appropriation.		Disbursements.	
Purpose.	Amount.	Purpose.	Amount.
Salary, superintendent of public health and State registrar.	$2,000.00	Salary	$2,000.00
		Traveling expenses ($625.80) for year not paid from funds of State board of health, but from general State fund.	
Office expenses	2,000.00	Traveling expenses	625.80
		Stationery and supplies	265.03
		Postage	163.02
		Telephone and telegraph	100.43
		Freight and drayage	14.40
		Printing	1,367.50
		Medical supplies	27.20
		Binding reports	32.50
		Miscellaneous	28.20
			2,624.08

Tabulation of appropriations and disbursements of the State board of health for fiscal year ending June 30, 1920—Continued.

Appropriation.		Disbursements.	
Purpose.	Amount.	Purpose.	Amount,
Clerical fund	$3,000.00	Salaries of clerical assistants	$2,331.85
			4,955.93
Rural sanitation	2,250.00	Salary, director surveys and inspection	1,154.82
		Traveling expenses	354.36
		Printing	211.60
		Miscellaneous	10.00
			1,730.78
Tuberculosis and child welfare	5,000.00	Salary, director of child welfare	652.33
		Salary, executive secretary	1,230.24
		Clerical assistance	415.30
		Tuberculosis nurse	1,257.60
		Clerical work	90.18
		Travelling expenses	408.38
		Printing	862.35
		Miscellaneous	14.95
			4,931.23
Venereal-disease control	2,250.00	Salary, director	1,500.00
Federal aid	1,583.59	Clerical assistance	399.96
		Extra help	100.00
		Traveling expenses	460.61
		Telephone and telegraph	8.25
		Printing	177.42
		Medical supplies	356.94
		Lectures	276.37
Total amount available	3,833.59		3,279.45
Bulletin and publicity work	2,200.00	Salary, executive secretary	408.45
		Stationery and supplies	326.99
		Postage	304.49
		Printing	691.00
Public-health lectures and educational work.	1,000.00		1,730.93
		Salary, executive secretary	421.87
		Clerical assistance	15.40
		Printing	235.84
		Educational films	225.00
		Miscellaneous	6.00
Total appropriation [1]	19,700.00		904.11
		Total disbursements [2]	16,532.43

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[1] $1,583.59 Federal aid for venereal-disease control not included.

[2] $625.80 expended from general fund of the State for travelling expenses of superintendent of public health not included.

By including the $1,583.59 received as Federal aid in venereal disease control, the total amount available is $21.283.59. Deducting the total expenditures of $19,532.43, an unexpended balance of $2,751.16 remains for the fiscal year. Five hundred and fifty-four dollars and fourteen cents of this balance belong to the venereal-disease fund.

RECOMMENDATIONS.

In view of the urgent need of a reorganization and coordination of the public-health activities of the State of Arizona, and further, considering the necessity for economy of administration, the following definite recommendations for improved sanitary organization are herewith submitted:

1. That the present designation of the State board of health be changed to the State health department.

2. That the State health department consist of a State health commissioner and a State board of health.

3. That the State health commissioner be a full-time officer, selected solely on merit, and appointed by the State board of health, at an annual salary of not less than $4,000 per annum; that he be a physician, skilled in sanitary science and experienced in public-health administration, and that he not be required to reside in the State prior to appointment; that he be prohibited from engaging in anything but official business; that he be authorized and charged with the administration of the laws and regulations issued thereunder by the department, and the preparation of regulations for the consideration of the State board of health, and, with the approval of the board, the appointment and removal of subordinates in the department.

4. That the State board of health consist of the State health commissioner, ex officio, and three members, at least one of whom shall be a physician; all to be public-spirited citizens, and appointed by the governor in such manner that the term of one shall expire every two years; that the State health department be empowered to promulgate regulations, to consider public-health plans, appeals and appointments, and to submit biennially to the legislative assembly, through the governor, a report of the recommendations as to needed legislation.

5. That the State board of health meet at least once annually, and on the call of the State health commissioner, or on request of a majority of the members, to consider and advise in public-health matters, and that its members receive necessary traveling expenses incurred while attending such conferences.

6. That the State health commissioner be required by the State board of health to attend conferences of State and Territorial health officers, convened by the Surgeon General of the United States Public Health Service under the act of Congress of July 1, 1902.

7. That the regulations not inconsistent with Federal or State laws promulgated by the State board of health be given the force and effect of law and be made the minimum requirements of localities throughout the State. That the State health commissioner be empowered to enforce such regulations to prevent disease and protect the public health in any locality where the local authorities neglect, fail, or refuse to do so.

8. That an epidemiologist be appointed by the State health commissioner, with the approval of the State board of health, at a salary of not less than $3,000 per annum, who shall be charged with the

epidemiological work of the State health department, such work to include the control of communicable diseases, industrial diseases, supervision of rural sanitation, dental hygiene, school inspection, and the control of venereal disease.

9. That a sanitary engineer be appointed by the State health commissioner, with the approval of the State board of health, at a salary of not less than $3,000 per annum, each engineer to make inspections and investigations relating to the purity of water and milk supplies, the disposal of sewage, garbage and other wastes, including industrial wastes, and to aid in the handling of sanitary-engineering matters, affecting the prevention of disease in towns and counties of the State.

10. That the director of the State diagnostic laboratory be appointed by the State health commissioner, with the approval of the State board of health, at a salary of not less than $2,500 per annum.

11. That a bacteriologist be appointed by the State health commissioner, with the approval of the State board of health, upon the recommendation of the director of the State diagnostic laboratory, at a salary of not less than $2,000 per annum.

12. That a public health nurse be appointed by the State health commissioner, with the approval of the State board of health, at a salary of not less than $2,400 per annum, to supervise, under the direction of the State health commissioner, child-welfare work throughout the State, and nursing, in relation to prevention of diseases.

13. That two inspectors be appointed by the State health commissioner, with the approval of the State board of health, at a salary of not less than $1,800 per annum, each, to make inspections, obtain samples for examination, and assist in the enforcement, under the direction of the State health commissioner, of the "pure food act," and such other sanitary regulations as may be promulgated by the State board of health.

14. That the State health department be authorized to exercise sanitary supervision over the production, handling, storing, and distributing of all milk that is offered for sale, and that authority to promulgate and enforce regulations for this purpose be given by law.

15. That all employees of the State health department be full-time and hold their office during efficiency.

16. That the present State laboratory, located at Tucson, be expanded into a State hygienic laboratory and be made an integral part of the State health department under the supervision and direction of the State health commissioner.

17. That the State hygienic laboratory be equipped and required to perform bacteriological examinations of water and milk supplies, sewage and waste disposal, cultures of disease-producing organisms,

and other public health specimens; that all chemical and bacteriological examinations of food and drinks, deemed necessary by the State health department in the enforcement of the "pure food act," be made in the State diagnostic laboratory at Tucson.

18. That the work of the State hygienic laboratory be expanded in amount and scope so that the physicians and public health officers in the State may have greater facilities to assist them in the diagnosis and control of communicable diseases.

19. That the collection and compilation of vital statistics, now performed in accordance with the law, be done by a chief statistician, under the supervision and direction of the State health commissioner.

20. That the model law for morbidity reports, adopted by the State and Territorial health officers, in conference with the United States Public Health Service, be changed to meet local requirements, and put into effect by regulations of the State health department.

21. That the State health department be authorized to remove from office, after due warning, any health officer or local registrar of vital statistics who fails, neglects, or refuses to perform the duties of his office in a manner satisfactory to the State health commissioner.

22. That energetic efforts be made to secure the notification of reportable diseases and complete registration of births and deaths.

23. That county registrars be required to appoint a sufficient number of local registrars, including local registrars for the rural areas surrounding incorporated towns and cities, and that statistics recorded by local city registrars include only the births and deaths occurring within that city or town.

24. That the State health department and local health authorities be charged specifically with the enforcement of existing State laws as affecting their jurisdictions.

25. That provision be made by which two or more counties, or towns and counties may combine in the employment of a full-time health officer.

26. That more adequate quarters for the State health department be provided in the State house at Phoenix.

27. That educational bulletins and leaflets of a popular nature on public health matters be published and otherwise secured for wide distribution throughout the State.

28. That all accounts with local and county registrars be kept and settled according to the present State fiscal year.

29. That more comprehensive regulations be promulgated by the State health department for the purpose of controlling the preventable diseases.

30. That every effort be made to procure adequate health departments in all counties, towns and cities.

31. That it be made compulsory by law for all persons, firms, corporations, towns or cities to secure from the State health department approval for any proposed installations, improvements, or changes of water supplies, sewage and refuse disposal systems.

32. That the State health department be empowered by law to prevent the use of water from any well, spring, or other source that in its opinion is dangerous to health.

33. That an epidemic fund be set aside for use, with the approval of the governor, in cases of epidemics, or other emergencies, affecting the public health.

34. That an annual appropriation of not less than $45,550 be made by the State to support the activities of the State health department, this amount to be expended about as follows:

1. State health commissioner	$4,000
2. Travel allowance for commissioner	900
3. Travel allowance for members of the State board of health	300
4. Epidemiologist	3,000
5. Travel allowance for epidemiologist	900
6. Sanitary engineer	3,000
7. Travel allowance for sanitary engineer	900
8. Bacteriologist (director of State laboratory)	2,500
9. Travel allowance, director of State laboratory	300
10. Assistant bacteriologist and chemist	2,000
11. Public health nurse (child welfare)	2,400
12. Travel allowance for public health nurse	900
13. Two milk and food inspectors ($1,800 a year each)	3,600
14. Travel allowance for milk and food inspectors	2,400
15. Chief clerk	1,800
16. Chief statistician	1,800
17. Stenographer and clerk	1,500
18. Stenographer, State laboratory	1,200
19. Clerk	1,200
20. Janitor, State laboratory	900
21. Additonal laboratory equipment	350
22. Laboratory supplies	300
23. Freight and express	500
24. Postage	500
25. Printing, stationery, and office supplies	2,500
26. Biological products	500
27. Miscellaneous	400
28. Funds for cooperative work with Federal and other health agencies, including tuberculosis, and venereal-disease control	5,000
Total	45,550

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